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The effect of road cycling vs. distance running on loaded and non-loaded limb bone density in recreational male athletes

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Previous studies have demonstrated the effect of physical activity on bone mineral density (BMD) on both weight bearing and non-weight bearing limbs. However, few studies have compared the BMD of recreational endurance athletes involved in cycling and running. The study consisted of male cyclists (non-weight bearing [NWB]; n=17, 42.3yrs (±10.38) 21-67yrs) and runners (weight-bearing [WB]; n=24, 42.6yrs (±13.63) 24-65yrs) were recruited from two-community sports club. A bone density ultrasound sonometer (Sunlight Omnisense 8000) was used to assess the BMD of the distal radius and mid-shaft of the tibia. Bone-loading history was estimated from a bone-specific physical activity questionnaire (BPAQ). In this study, cyclists [NWB] showed significantly greater ($p<0.05$) bone density in both the loaded (tibia) and non-loaded limbs (radius) than the runners [WB] despite having similar age, weight and body mass index. Fifty percent of runners were found to exhibit osteopeanic values of the tibia compared with 18% in cyclists. Radial osteopenia was not seen in the cyclists but was demonstrated in 12.5% of runners. A negative relationship between BMD of the radius and the lifetime loading history scores (pBPAQ) was found within both group of athletes ($r =-0.521$, $r2$ 0.271, $p<0.001$) with similar results found for tibial BMD and weekly training hours performed during the preceding 12months (cBPAQ) for both groups ($r=-0.410$, $r2$ 0.168 $p <0.05$). In conclusion, the cycling cohort demonstrated an increased BMD in both the loaded and non-loaded sites when compared to anthropometrically matched runners. However quantification of site-specific geometrical adaptation to lower limb bone diameter and cortical thickness may be of more importance to runners than bone mass.

Biography

Marc Potter is a former personal trainer and exercise professional and completed his MSc in Exercise and Sport Physiology at Manchester Metropolitan University in 2015. With a passion for ultra-endurance, he has participated in over 90 marathon, ultra-marathon and Ironman triathlon. As a Lecturer in Exercise Physiology, his research interests are in Ultra-endurance, Immunology and Fatigue.

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